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Non-surgical management of spinal epidural hematoma after kyphoplasty: A case report

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ABSTRACT

Kyphoplasty and Vertebroplasty (VP) are accepted therapeutic approaches to treat pain associated with vertebral compression fractures. Major complications such as cord or root compression, subdural and epidural hematomas (EDH), as well as pulmonary emboli, have been reported in less than 1% of patients. Spinal EDH is an extremely rare complication that usually happens a few hours after the procedure. We report a case of spinal EDH that developed four days after a successful kyphoplasty.

1. Introduction

Since Galibert et al. reported the first successful vertebroplasty in 1987 [1], it has become a global accepted procedure for treating vertebral compression fracture [2–6]. According to aging population and lifestyle changing, the rate of kyphoplasty and vertebroplasty has dramatically raised in recent years [7].

Despite the high safety level of these procedures, major complications such as adverse reaction to the bone cement, anaphylaxis, pulmonary embolism, spinal cord compression, pedicle fracture, epidural hematoma, subdural hematoma, arterial injury, vertebral body fracture, and death occur in less than 1% of patients after a transpedicular VP or kyphoplasty [2,3,6].

Spinal epidural hematoma is an extremely rare complication [8]. In this paper, we have reported a spinal epidural hematoma that has occurred four days after kyphoplasty. Although surgical management is the first choice in management of this complication, we have managed the condition with a watch-and-wait strategy because of the patient's medical condition.

2. Case report

A-64-year old lady presented with back pain, beginning two months prior to the admission to emergency ward. According to her past medical history of Giant cell arthritis, she was transferred to the rheumatology department in order to survey rheumatologic causes of back pain, where a vertebral fracture has been diagnosed by spinal imaging. Therefore, the patient was consulted with the neurosurgery service. In our first visit, she complained about severe non-radicular back pain (Visual Analogue Scale, VAS, nearly 7–9) in the upper lumbar area that was resistant to analgesic agents. In physical examinations motor forces were full and no upper motor neuron sign or paresthesia was present.

According to obvious T11, T12 and L1 pathologic fractures in the images (Fig. 1), she needed a surgical intervention in order to control her analgesic resistant back pain. Also, evidences of L4 body fracture and also L5_S1 grade 2 spondylolisthesis were noted in the images (Figs. 1, 3 and 4), not compatible with the patient complaint of upper lumbar pain without any radicular pain. So, she was scheduled for T11, T12 and L1 kyphoplasty. The patient was also under treatment with aspirin and warfarin related to previous history of aortic valve replacement. In laboratory tests, Prothrombin Time (PT) was 27 s, Partial Thromboplastin Time (PTT) was 36 s, and International Normalized Ratio (INR) was 2.56. Considering her past medical history and abnormal coagulation tests, cardiologist consult was requested. They changed Warfarin to Heparin for four days before kyphoplasty, and heparin was stopped four hours before the procedure. T11, T12 and L1 Kyphoplasty were done (Fig. 2). Nearly 24 h after the surgery, warfarin and heparin started together for three days, then heparin stopped and warfarin continued alone. In the third day after the procedure, the patient was discharged without any complaints and her back pain was better (VAS = 1–3).

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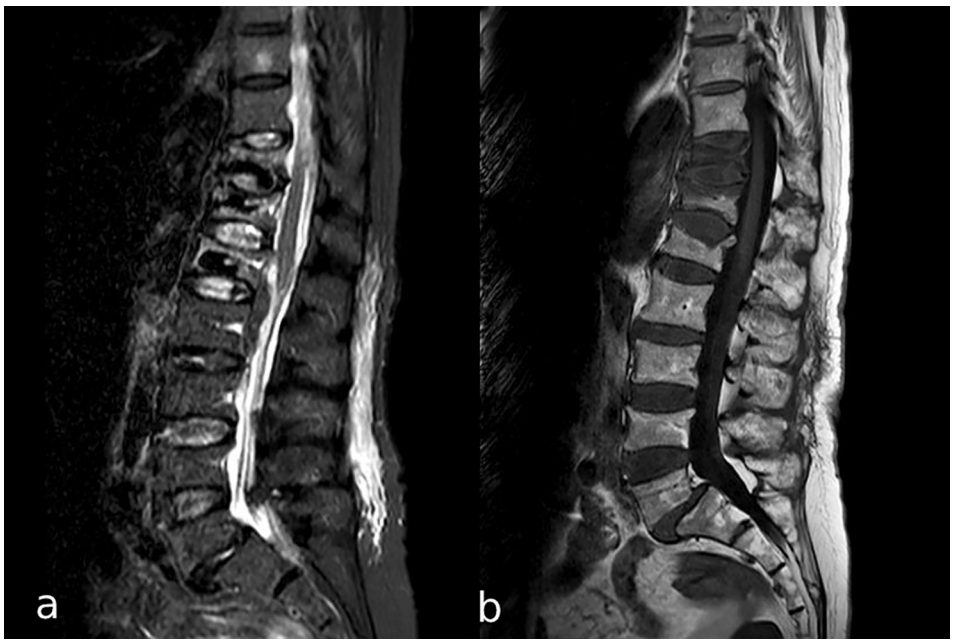

Fig. 1. Magnetic resonance images in STIR sagittal plane (a) and T1saggital plane (b) revealed pathologic acute or sub-acute T11, T12 and L1 body fractures with cord compression.

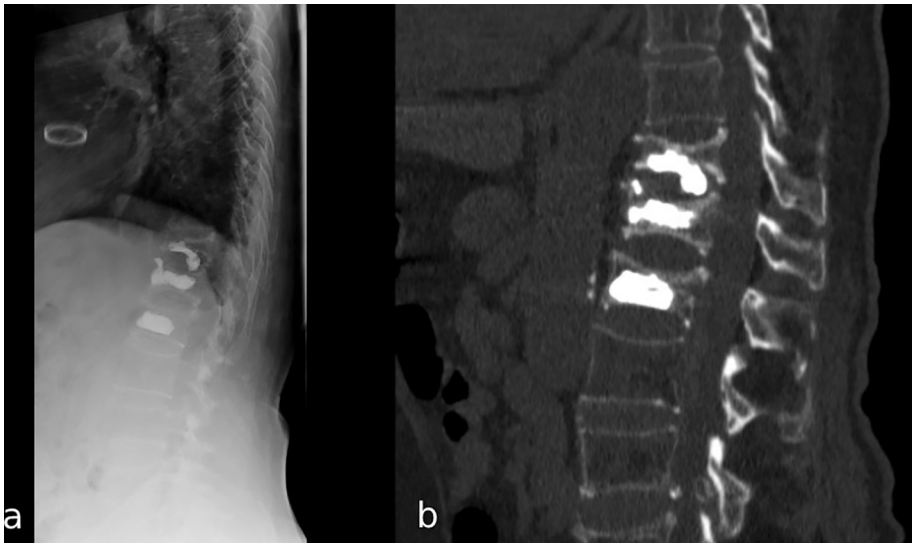

Fig. 2. Sagittal plane thoracolumbar X-ray (a) and CT scan, (b) after kyphoplasty.

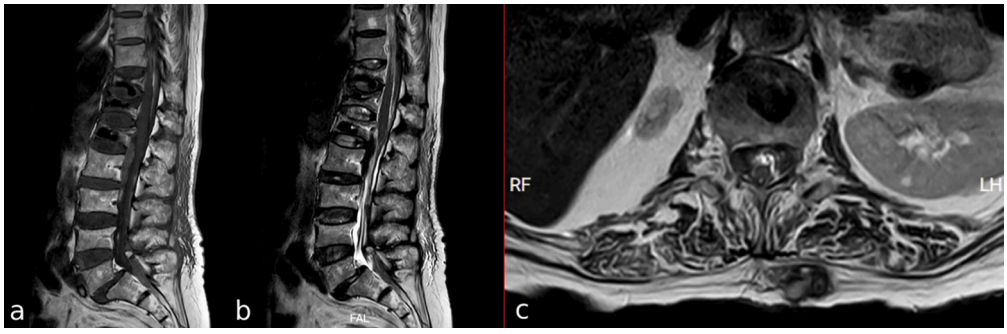

Fig. 3. L1, L2 and L3 epidural hematoma after kyphoplasty in sagittal T1 (a), sagittal T2 (b) and axial T2 (c) MRI.

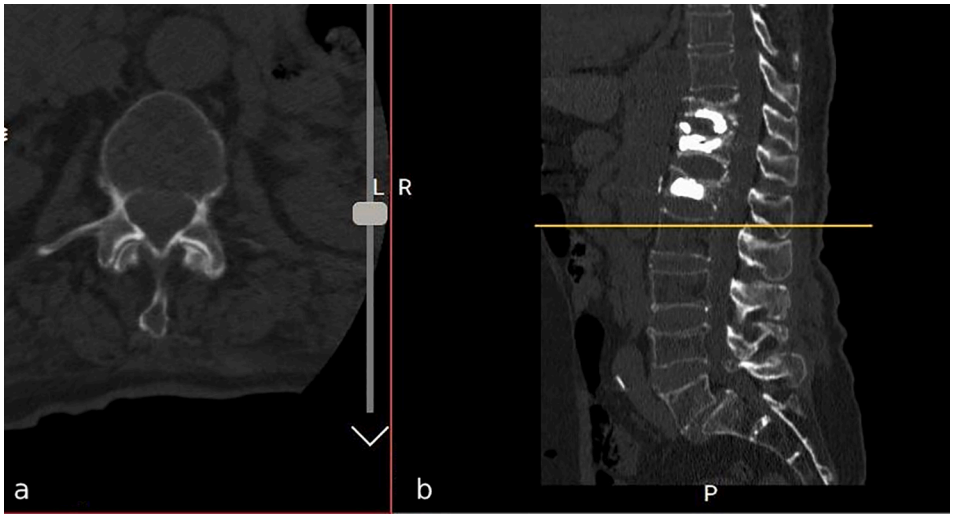

Fig. 4. Resolved epidural hematoma after three months in axial (a) and sagittal (b) CT scan.

Twenty-four hours later, she returned to the hospital with severe back pain (VAS = 4–6) radiated to the both lower extremities (Oswestry Disability Index, ODI, 41–60), as well as decreased motor forces in both lower extremities, proximal and distal, nearly to 3/5. Considering such sudden onset acute presentations not related to the previous listhesis, the patient admitted in the neurosurgery department in order to detect any complication. She was consulted with cardiologists according to the mentioned history of cardiac disease and mechanical aortic valve in order to assess coagulation profile and permission to magnetic resonance imaging (MRI). According to suspected MR-compatible valve, MRI permission was limited to urgent and lifesaving situations. Finally, thoracolumbar MRI demonstrated spinal epidural hematoma (Fig. 3). Warfarin was discontinued because of coagulopathy and raised INR. She underwent conservative management without any neurosurgical intervention in order to reduce INR to the normal ranges, suitable for surgical evacuation of hematoma.

After a week during conservative management, her complaints about back and radicular pain, as well as paraparesis were resolved (VAS: 1–3 and ODI: 0–20); also, all motor forces were fully recovered. According to the clinical improvements, in addition to our limitations for further MRI-considering her mechanical aortic valve-, we restarted warfarin and discharged the patient and followed her closely in the outpatient clinic.

Nearly three months later, she was visited in our clinic with good forces, nearly 5/5. At that time, Computed Tomography (CT) has confirmed resolving hematoma and accepted condition of cemented vertebra (Fig. 4).

3. Discussion

Epidural hematoma after kyphoplasty or vertebroplasty is extremely rare. Birkenmaier et al. [9] reported a case with an epidural hematoma over T11–L2 after vertebroplasty. They have claimed the first report of epidural hematoma after vertebroplasty. The patient was an 82 year old woman that had developed left leg paresthesia and also paresis just fifteen minutes after vertebtoplasty. Her motor forces have fully recovered after left sided hemilaminectomy. McArthur et al. presented two cases of hematoma from 1150 cases of percutaneous kyphoplasties they have reported. One of the hematomas was L1 epidural and the other was subcutaneous hematoma. In a case of epidural hematoma, the patient has presented with right sided monoparesis after kyphoplasty which has diminished after decompression of spinal cord by laminectomy [10]. Yaltırık et al. [11] have reported a case of epidural hematoma after vertebroplasty. They have evacuated the hematoma with a very thin catheter at superior and inferior levels. They reported that the paraplegia has completely resolved two days after evacuation of the hematoma. Fattahi et al. had presented a case of late onset cervical spine epidural hematomas (CSEH) that has spontaneously resolved after conservative management [8].

Conservative management of spinal epidural hematoma with severe deficits is reported in extremely rare situations. In our case, considering the previous history of aortic valve replacement, we started the anti-coagulants 24 h after kyphoplasty and discharged the patient on the third day. She came back with severe neurologic signs and symptoms four days after kyphoplasty, without any history of back trauma. Epidural hematoma revealed in MRI but According to our limitation for early laminectomy (her medical condition), we had no choice but to stop warfarin and manage her conservatively. After nearly one week, her pain and neurologic deficits fully recovered without any neurosurgical intervention. Considering her mechanical aortic valve related considerations, we restarted warfarin, discharged and followed her closely in the clinic without any complication after months.

4. Conclusion

Despite surgical management that has been described in the previous reports in order to evacuate the hematoma; we performed conservative managements instead of early surgical intervention, considering our patient coagulopathy. Our patient's neurologic deficits fully recovered during conservative management without any surgical intervention that could be dangerous in such cases.

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None.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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